

## Claims

1. A steel material for hot press forming characterized by comprising a base steel material having a zinc or zinc alloy plated layer formed on the surface of the base steel material, the plated layer having on its surface a barrier layer which  
5 prevents vaporization of zinc during heating.
2. A steel material for hot press forming as claimed in claim 1 wherein the barrier layer is an oxide layer based on an oxide of zinc.
3. A steel material for hot press forming as claimed in claim 2 wherein the oxide layer has a weight of at least  $10 \text{ mg/m}^2$  as Zn.
- 10 4. A steel material for hot press forming as claimed in claim 1 wherein the barrier layer is a plated coating based on at least one metallic substance selected from the group consisting of Fe, Ni, Co, and alloys thereof.
5. A steel material for hot press forming as claimed in claim 4 wherein the plated coating has a coating weight of  $0.2 - 10 \text{ g/m}^2$ .
- 15 6. A steel material for hot press forming as claimed in claim 1 wherein the zinc or zinc alloy plated layer is a galvanealed layer.
7. A steel material for hot press forming as claimed in claim 6 wherein the galvanealed layer has a Fe content of 5 - 80% and a coating weight of  $10 - 90 \text{ g/m}^2$  as Zn.
- 20 8. A steel material for hot press forming as claimed in claim 6 wherein the base steel material has a P content of at most 0.015%.
9. A steel material for hot press forming as claimed in claim 6 wherein the

base steel material has a Si content of at most 0.1%.

10. A steel material for hot press forming as claimed in claim 1 wherein the base steel material has a C content of 0.08 - 0.45%.

11. A steel material for hot press forming as claimed in claim 10 wherein the  
5 base steel material contains one or both of Mn and Cr in an amount of 0.5 - 3.0% in total.

12. A steel material for hot press forming as claimed in claim 10 wherein the base steel material contains 0.0001 - 0.004% of B.

13. A method of manufacturing a surface treated steel material for hot press  
10 forming characterized by applying zinc or zinc alloy plating to the surface of a steel material, and oxidizing the surface of the resulting plated coating to form on the surface of the plated coating a barrier layer which suppresses vaporization of zinc.

14. A method of manufacturing a steel material for hot press forming characterized by applying zinc or zinc alloy plating to the surface of a steel material,  
15 and contacting the resulting plated steel material with a solution containing an oxidizing agent.

15. A method of manufacturing a steel material for hot press forming characterized by applying zinc or zinc alloy plating to the surface of a steel material, and contacting the resulting plated steel material with a solution containing Zn ions  
20 and an oxidizing agent to form on the surface of the plated coating a barrier layer which suppresses vaporization of zinc.

16. A method of manufacturing a steel material for hot press forming characterized by applying zinc or zinc alloy plating to the surface of a steel material, and subjecting the resulting plated steel material to anodic electrolysis in an aqueous

solution to form on the surface of the plated coating a barrier layer which suppresses vaporization of zinc.

17. A method of manufacturing a steel material for hot press forming characterized by applying zinc or zinc alloy plating to the surface of a steel material, and subjecting the resulting plated steel material to electrolysis in an aqueous solution containing Zn ions and an oxidizing agent with the steel material as a cathode to form on the surface of the plated coating a barrier layer which suppresses vaporization of zinc.

18. A method of manufacturing a steel material for hot press forming characterized by applying zinc or zinc alloy plating to the surface of a steel material, and forming on the surface of the resulting plated coating a barrier layer which suppresses vaporization of zinc by coating the surface of the plated steel material with a solution containing a ZnO sol followed by drying.

19. A method of manufacturing a steel material for hot press forming comprising subjecting a steel material to hot dip galvanizing and subsequent galvanealing heat treatment in a continuous hot dip galvanizing line, characterized in that the maximum heating temperature in the continuous hot dip galvanizing line is less than the  $Ac_1$  point of the steel and the galvanealing heat treatment temperature is at least 500°C and at most the  $Ac_1$  point.

20. A method of manufacturing a steel material for hot press forming comprising subjecting a steel material to hot dip galvanizing and subsequent galvanealing heat treatment in a continuous hot dip galvanizing line, characterized in that the maximum heating temperature in the continuous hot dip galvanizing line is not lower than the  $Ac_1$  point of the steel, the average cooling speed from the maximum heating temperature to 500°C is less than the critical cooling speed for the steel, and the galvanealing heat treatment temperature is at least 500°C and at most the  $Ac_1$  point.